

Rejections under 35 U.S.C. § 103

Claims 5, 7, 8, 10, and 11 were rejected as obvious over U.S. Patent No. 4,794,994, issued to Deane et al. ("the '994 patent") in view of U.S. Patent No. 6,006,846, issued to Tibbets et al. ("the '846 patent"). This rejection is respectfully traversed.

The '994 patent discloses a drag type drill bit having cutting elements and fluid discharge orifices positioned such that a single orifice is utilized for a plurality of cutting elements (Col. 2, lines 65-67). A stud-type cutting element is disclosed, having a flat disk disposed thereon, at an angle to the longitudinal axis of the stud (Col. 4, lines 55-62 and Fig. 4). Disposed upon the flat disk of the stud is an outer diamond layer (Col. 4, lines 62-65 and Fig. 4 reference 54). As can be seen in Fig. 4, the diamond layer 54 comprises a relatively thin overlay on the cutting face 53. In order to permit proper orientation and exposure of the cutting element, the bit body extends further along the rear of the cutting element and is shorter along the side having the cutting face 53. Thus, there is a relatively large space between the cutting face 53 and the bit body.

A drill bit according to the embodiments of claims 5, 7, 8, 10, and 11 comprises a mounting pad having a relief groove (26 in Fig. 3) formed in the bit body under a position of a diamond table of a cutting element. The relief groove extends back from an outer surface of the blade at least about 40 percent of that portion of a thickness of the diamond table that does not extend past the outer surface. The formation of such a groove at this location with respect to the diamond table advantageously provides stress relief between the diamond table and bit body, while obviating the need to dispose the diamond table so that it protrudes beyond the bit body.

In the only embodiment of the '994 patent wherein both a diamond table and a recess are disclosed, the recess is not formed under the diamond table (Fig. 4). In fact, the entire thickness of the diamond table adjacent to the recess in Fig. 4 of the '994 patent is disposed beyond the periphery of the recess and adjacent bit body. Furthermore, the type of studs used in the '994 patent, having the majority of their substrate embedded within the body of the bit, require that the bit body be formed so that the studs can be supported on one side against the forces exerted by their contact with the hole bottom, while the other side is recessed to expose the entire cutting face to the hole bottom. Therefore, the area characterized as being analogous to a "relief groove" is actually no more than a required design parameter for that specific type of

stud. Figure 2 of the '994 patent fails to disclose a diamond table and therefore cannot be said to disclose or suggest the embodiments of the instant claims.

The '846 patent fails to provide the teaching which the '994 patent lacks. Nothing in the '846 patent discloses or suggests the provision of a relief groove, as recited by the instant claims. Thus, the provision of a relief groove according to these claims with this type of cutting element, as opposed to the studs of the '994 patent, is a novel feature of these claims that is neither disclosed nor suggested by either prior art reference. Therefore, claims 5, 7, 8, 10, and 11 are allowable over these prior art references. Accordingly, withdrawal of this rejection is respectfully requested.

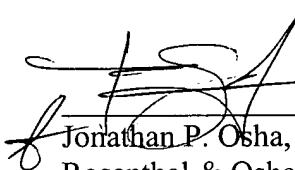
Claims 6 and 9 were rejected as obvious over the '994 patent in view of the '846 patent and further in view of U.S. Patent No. 6,220,117 B1, issued to Butcher ("the '117 patent"). This rejection is respectfully traversed. Because claims 6 and 9 depend from claims 5 and 8, respectively, they are patentably distinct for at least the same reasons discussed above with regard to independent claims 5 and 8. Neither the '994 patent nor the '846 patent discloses or suggests the use of a relief groove with cutting elements according to claims 6 and 9. The '117 patent also fails to disclose or suggest such a combination. Rather, it only relates to a particular bit body composition. Therefore, claims 6 and 9 are allowable over these prior art references. Accordingly, withdrawal of this rejection is respectfully requested.

Conclusion

Claims 5-11 have been shown to be allowable over the prior art. Applicant believes that this paper is responsive to each and every ground of rejection cited by the Examiner in the Action dated August 1, 2002, and respectfully requests favorable action in the form of a Notice of Allowance. Please apply any charges not covered, or any credits, to Deposit Account 50-0591 (Reference Number 05516.084001).

Respectfully submitted,

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